



ROUNDUP

NASA LYNDON B. JOHNSON SPACE CENTER

HOUSTON, TEXAS

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Friday, November 19, 1976

JSC workers receive annual NASA awards

Seven JSC employees, one program team and two educators doing support work here were honored Nov. 4, at the 1976 Annual Awards Ceremony at NASA Headquarters.

Scientific Achievements

Receiving NASA Exceptional Scientific Achievement Medals were:

Dr. Laurence E. Nyquist, Lunar and Planetary Sciences Division – for providing detailed knowledge of time scales for the early chemical evolution of the Moon and its crust, for determining precise ages of lunar basalts and for contributing to the design, testing and certification of lunar sample storage procedures and facility construction.

Dr. Jeffrey L. Warner, Lunar and Planetary Sciences Division – for contributions to understanding of major meteorite impact basins of the Earth and Moon and to the definition and implementation of requirements for the lunar sample remote storage facility and curatorial facilities at JSC.

Dr. Gerald R. Taylor, Space Research and Operations Division – for significant contribution to study of the infectious disease process in space flight, leading to a new understanding of the balance between the human immune system and contaminating microorganisms under spaceflight conditions.

Dr. Klaus Keil, University of New Mexico for outstanding achievements in identification and characterization of lunar rock fragments and contributions to long-term preservation of lunar samples.

Dr. M. Nafi Toksoz, Massachusetts Institute of Technology – for contributions to understanding the Moon's internal structure through interpretations of lunar seismic data and development of integrated theoretical models of the lunar interior.

Exceptional Service

Receiving NASA Exceptional Service Medals were:

Robert C. Hood, manager, Orbiter Project Control Office – for outstanding managerial leadership and personal dedication in planning and direction of business management activities for the Orbiter Project.

Robert B. MacDonald, chief, Earth Observations Division – for outstanding achievements in development and application of remote sensing techniques to the solution of environmental and natural resource management problems.

James L. Neal, Director of Procurement – for outstanding managerial leadership and personal dedication in planning and directing JSC's Procurement Program, contributing to the progress of the Shuttle Program and success of previous manned programs.

Equal Opportunity

A NASA Equal Employment Opportunity Award was presented to:

Philip H. Whitbeck, director, Administration and Program Support – for outstanding achievements in development and implementation of programs contributing to employment and advancement of talented women and minorities into managerial positions and for work with predominantly minority universities encouraging interest in public administration.

Group Achievement

A NASA Group Achievement Award was presented to:

Summer Medical Student Intern Program team, JSC and Ames Research Center – for outstanding achievements in development and implementation of the program which has significantly involved minority and women medical students in NASA's life sciences programs.



Glynn S. Lunney

Space-based solar power study set

Space-based solar power concepts will be studied under a contract which NASA will negotiate with the Boeing Aerospace Co.

Value of the contract is approximately \$970,000, which is jointly funded by the Energy Research and Development Administration and NASA.

The terms of the 12-month, two-phase study call for Boeing to first derive specific, comprehensive data necessary for NASA on the most effective means of accomplishing solar energy-to-electrical energy conversion on a solar power satellite system and also determine at what location (or locations) in space the various phases of the solar power satellite should be constructed and assembled.

The second part of the study calls for Boeing to define in more detail the overall solar power satellite system to reduce the uncertainties in the areas of weight and cost estimates. The first phase of the contract is five months long and the second phase is seven months long.

The solar power satellite system is envisioned as a means of providing uninterrupted energy beam to Earth from large satellites in a fixed orbit 22,000 miles above the Earth.

HQ appoints Lunney Space Flight deputy

Glynn S. Lunney has been appointed NASA Deputy Associate Administrator for Space Flight. He replaces Dr. William C. Schneider who is assigned to Goddard Space Flight Center, Greenbelt, Md., as Director of Project Management.

In his new post, which he will fill until Dr. Schneider's assignment is completed, Lunney will report to the Associate Administrator for Space Flight, John F. Yardley.

Before assuming his new assignment at NASA Headquarters, Washington, D.C., effective Nov. 9, 1976, Lunney served as manager, Shuttle Payload Integration and Development Program Office at JSC.

Clifford E. Charlesworth will act as manager of SPIDPO during Lunney's absence, and Charlesworth's replacement in an acting capacity as manager, Earth Resources Program Office, is his assistant, William E. Rice.

Lunney, a native of Old Forge, Pa., holds a BS degree in aeronautical engineering from the Uni-

versity of Detroit. His NASA career began at the NASA Lewis Research Center, Cleveland, Ohio in 1958. In 1959, he transferred to the Space Task Group at the NASA Langley Research Center, Hampton, Va., and later moved with the Group to Houston.

From 1964 to 1968, Lunney served as chief, Flight Dynamics Branch as well as being a prime Flight Director during the Gemini program. He continued his Flight Director role throughout the Apollo Program, becoming head of the Flight Director's Office in 1969. In 1972, Lunney was named manager, Apollo Spacecraft Program Office, and technical director, Apollo-Soyuz Test Project.

Among Lunney's numerous awards are the NASA Distinguished Service Medal; the NASA Exceptional Service Medal; the Lawrence Sperry Award, 1970; and the Arthur S. Flemming Award, 1974.

Lunney is married and has four children.



COMFORT CONTROL – Suited-up in a Liquid Cooled Garment, Debbi Guichard of Northrop Services Inc. exercises on a treadmill in the Environmental Physiology Laboratory. Guichard and suit technician Al Rochford, right, are conducting a feasibility study of an automatic comfort controller for Shuttle Extravehicular Mobility Units.



CAREFUL LOADING – Crew Escape System Test Vehicle is carefully loaded on flatbed truck by Rockwell International Corporation's Space Division employees, for delivery to Holloman Air Force Base, Alamogordo, N.M. Duplicate of Orbiter's crew compartment will be used in upcoming sled tests to verify functional operation of Orbiter's escape system.

Balloons fill space age needs

JSC scientists studying the Earth's atmosphere and astronomers trying to look beyond it are both employing a seemingly outdated means of transportation – the helium-filled balloon.

The upper atmosphere itself is both an object of investigation and a hindrance to it.

Scientists wishing to study the ozone layer, cosmic rays, or particles such as antimatter need a vehicle to carry their equipment to the desired altitude.

Astronomers wanting to test a new ultraviolet telescope need to elevate the device above the ozone layer which absorbs almost all ultra-

violet and cosmic radiation.

Balloons are used because of certain advantages they hold over other vehicles like airplanes and sounding rockets which also operate in the rarefied atmosphere between 30 and 50 kilometers (18 and 31 miles).

Whereas an airplane can carry experiments to high altitudes, it cannot remain stationary for long periods as balloons can. And, the higher the airplane flies, the less payload it can carry.

A balloon can carry an extremely heavy payload like 1,800 kilograms (4,000 lbs.) as high as 50 kilometers. Sounding rockets can, of

course, fly much higher, but the time they spend in the stratosphere is measured in minutes; balloon time can be extended to days and weeks.

For these certain advantages NASA uses balloons extensively for a wide range of tests and experiments conducted by JSC and other NASA centers.

In upper atmospheric studies the Environmental Effects Office at JSC has been using balloons for three years as part of the Space Shuttle stratospheric environmental evaluation and the national examination of the effects on the ozone

(Continued on page 4)



CLASS OF '76 — Eight JSC employees who recently earned high school diplomas through a cooperative "on-clock" educational project of JSC, Pasadena Community Evening School and the Harris County Department of Education are pictured here with Stanley Goldstein, chief, Employee Development Branch. They are, l to r, Jerry Fleming, Elsie Easley, Barbara Matelski, Helen Ragsdale, Goldstein, Gilbert Cisneros, Chuck Ritchie, Margaret Buford and James Clarke. For information on the program, call Eugene Horton, X-3734.

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Houston ASPA chapter regroups; 4 from JSC are elected officers

After several years of inactivity, the Houston Chapter of the American Society for Public Administration was revitalized Oct. 27 and four JSC employees are serving it in official capacities.

Jack Stanley of the R&D Resources Branch, Institutional Resources Division was selected vice president at a meeting attended by administrative personnel from all levels of government and faculty and students from area universities. The meeting was held at the University of Houston.

Evon Collins of the Central Re-

sources Control Office, Financial Management Division, was chosen treasurer.

Named to the Council — the chapter's advisory board — were Philip H. Whitbeck, director, Administration and Program Support, and Leslie J. Sullivan, chief, Management Analysis Office.

The more than 100 Houston-area members of the national society are now offered an active local chapter with which to associate, Stanley said.

The organization includes professional practitioners, faculty and

students of public affairs. It is dedicated to improving public service at all levels of government with varied programs involving the exchange, development and dissemination of information about public administration.

"Dissemination is an important part of it," Stanley said. "That's one thing we hope to concentrate on."

He said the chapter plans to host public speakers and debates and possibly conduct studies of public issues where expertise on the topic is available within the chapter.

A series of programs are being planned to begin in early December. Details will be announced.

Other new officers include Dr. Jay Shafritz, professor of public affairs at the University of Houston at Clear Lake City, president; Dr. Mitchell F. Rice of Prairie View A&M University, secretary, and Bob Owens, U.S. Army Reserve, membership chairman.

Also named to the Council were Dr. Rosemary Pledger, dean of the School of Professional Studies, UH/CLC, and Dr. Grover Starling, Program Director in Public Affairs, UH/CLC.

Spaceflight book set now on sale

The JSC Exchange Store is offering the five-volume chronology of *Man in Space* for a special purchase savings of more than 50 percent.

The set, which normally sells for \$13.95, is now available for \$6.50 while supplies last. They are available at Bldg. 3 and Bldg. 11 stores, beginning Nov. 22.

The series traces man's space achievements from the pioneering work of Goddard and Tsiolkovsky through Peenemunde, Sputnik, Mercury, Gemini and Apollo.

Easy to read and containing thousands of NASA photographs, the books would make a great Christmas gift for space buffs of any age.

Lewis, Thornton get top secretary honors

Karen L. Lewis and Hannah L. Thornton have been chosen to receive JSC's Outstanding Secretary Award for October and November, respectively.

Lewis is secretary to Robert R. Frazer, manager of the Palmdale (Calif.) Operations Office, and is the only secretary assigned to the NASA Palmdale organization.

Her nomination states, "Karen is enthusiastic about her work and projects a courteous, helpful and friendly attitude toward all of the office personnel, visitors and many contractor employees she comes in contact with every day."

"Not only does she perform secretarial duties but she also works as travel coordinator, communications center operator and unofficial public affairs representative."

Thornton is secretary to Martin L. Raines, director, Safety, Reliability and Quality Assurance.

In nominating her, Raines said, "The most significant characteristic of Mrs. Thornton's performance is not the fact that she demonstrates superb secretarial skills, nor the helpful, friendly and courteous attitude she portrays to visitors and

telephone callers to the office, nor the intense personal interest and devotion to the activities of the SR&QA office.

"Rather," he said, "her performance is most impressive because of the consistent and dependable day-in and day-out outstanding manner in which she accomplishes all aspects of her job."

Both women are presented plaques and \$100 cash awards.



Hannah Thornton

Jernigan joins UTMB

Former NASA flight surgeon Dr. Clarence Jernigan has joined the faculty of the University of Texas Medical Branch at Galveston as assistant professor in the department of family medicine.

Jernigan worked at JSC from 1964-72. He was involved in five

moon landing missions and was isolated as the attending physician for the Apollo 12 astronauts.

Prior to assuming his new position, Jernigan spent 18 months in the Gaza Strip as a staff physician at the Southern Baptist Hospital.

Fire safety devices offered at discount

Home fire safety equipment at reduced prices is again being offered by the JSC Exchange through a special bulk purchase arrangement with the distributor.

Orders were taken for the devices last summer but many employees expressed interest too late to get in on the discount.

The Exchange will take new orders Nov. 22 to Dec. 11.

Equipment and prices are:

BRK Model 76R battery-operated, dual chamber, ionization-type smoke detector w/Mallory mercury battery. Suggested retail \$49.95, for \$36.

BRK Model 769ACL AC-powered, dual chamber, ionization-type smoke detector w/9-ft cord. Suggested retail \$39.95, for \$26.50.

Walter Kidde Model 2 5/8 TPS tri-class extinguisher, UL-rated IA10BC w/wall mount bracket. Suggested retail \$19.75, for \$11.50.

Walter Kidde Model MB15 vehicle mount bracket for above. Suggested retail \$2, for \$1.25.

Walter Kidde Model 6 TPS tri-class fire extinguisher, UL-rated 2A40BC w/wall mount bracket. Suggested retail \$35.50, for \$18.

Walter Kidde Model MB16 vehicle mount bracket for above. Suggested retail \$2.50, for \$1.75.

Data sheets and samples can be inspected at the Bldg. 11 Exchange Store, 10 a.m.-2 p.m. daily.

Payment must accompany orders. The store will receive delivery of all items approximately 30 days after the close of the sale.

Film program slated

Two films on motivation narrated by Dr. Eden Ryl will be shown at the Nov. 23 meeting of the NASA Clear Lake Chapter, National Secretaries Association (International). The meeting will be at the Old Swiss House on NASA Road 1.

The films, "You Pack Your Own Chute" and "You Can Surpass Yourself," are 28 minutes long each.

In one, Dr. Ryl demonstrates how she learned, using a BB gun, to shoot an aspirin thrown into the air. She shows that a person's limitations are self-created and success can be achieved through self-motivation and personal conviction.

The films will begin about 6:30 p.m., following dinner. For reservations, call Claudette Alderman, 488-7676.

ROUNDUP

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THINK EVS

NEED A NEW ONE? (AND SHORT OF CASH?) YOUR EQUIPMENT VISIBILITY SYSTEM COORDINATOR MAY BE ABLE TO HELP. THINK EVS!

CALL THE SEARCHERS AT 5506 or 2281

JSC takes 4th overall

Dragich, Edmiston jog to first place

Two JSC joggers took individual first place honors and led the center to an overall fourth place showing in the second NASA Intercenter Postal Jogging Competition.

Sue Dragich breezed into the top spot in the Women Under 30 category. Her 13 minute, 16 second time for the two-mile run was 2 minutes, 16 seconds faster than the nearest competitor.

Claud Edmiston's time of 10:34, fastest of any JSC runner, gave him an easy win in the Men 40-49 group.

Ames Research Center scored a 69-point total to win the overall contest. Jet Propulsion Laboratory was second with 66 points, Headquarters was third with 53.5 and JSC took fourth with 50 points.

Nine centers and 246 runners, including 38 women, took part in the competition Oct. 21. Joggers ran on two-mile courses near each center and their times were sent to Ames, the host center, to determine final standings.

Other JSC runners finishing in the top ten of their respective age categories were Jim Gilbert (10:36), third, and Louis Schiavo (10:55), fifth among Men 30-39; Neil Griffith (11:44), fifth among Men Under 30; Billie Gibson (18:37), sixth, Women 30 and Over; Rele Evans (12:03), eighth, and Olav Smistad (12:12), ninth, Men 40-49.

Fastest time in the competition was 10:15 run by Earl Dunham of Langley Research Center in the Men 30-39 category.

Travel club planning varied 1977 itinerary

Would you like to go to Hawaii or the Orient? How about England, Scotland, Wales and Ireland? How does a relaxing week in the Bahamas sound? Or a long weekend in New Orleans?

These are among many trips being planned by the JSC Cultural Club as part of its 1977 activities.

In addition to several long trips, the club is planning many two- and three-day weekend trips to various points of interest such as Palo Duro Canyon. San Antonio will be visited during its colorful Fiesta celebration in April.

If you have a suggestion for a trip, any officer of the club will be

glad to hear from you.

To participate in any of the club trips or activities you only have to send in your dues. Do it now!

Family memberships are \$7; single memberships are \$4. Renewals are \$2 for families or \$1 for singles.

A particular advantage of membership is the special club discount members receive on trips. Amount of the discount depends on the number participating — the more, the better!

For information about membership, questions or suggestions, contact Lois Miller, FD4, X-3216.

EAA ATTRACTIONS



TICKETS

The following tickets are available at the Bldg. 11 Exchange Store from 10 a.m.-2 p.m., Monday-Friday:

Astroworld — Half-price tickets good through the end of the season, Nov. 28, may be purchased at \$3.75 for adults, \$3.25 for children.

Houston Aeros — EAA discount gift coupons may be exchanged at the Summit box office for "live" tickets on the night of the game. A \$6.50 coupon gets you an \$8 ticket, \$5.50 gets a \$7.50 ticket and \$4 gets a \$5 ticket. Aeros play Edmiston, Nov. 23 and Dec. 3, Winnipeg, Nov. 26, and Phoenix, Dec. 14.

Six Flags Funseekers Club — Free membership cards. Six Flags will be open weekends through November.

ABC Interstate Theaters — \$1.50 admission tickets.

Dean Goss Dinner Theater — Comedy production, *Take My Wife*, \$16/couple. Tickets available every night except Monday, Saturday, through Nov. 27. Comedy *Opal's Baby* begins Nov. 30.

Disney Magics Kingdom Club — Free membership cards.

Sea-Arama Marineworld — Tickets on sale, \$3.75 for adults, \$2.50 for children. Open until dusk year-around.

Windmill Dinner Theater — \$14/couple for *Beginner's Luck* starring Bob Crane. Tickets good Weds-Thurs-Sun only through Dec. 3.

CHILDREN'S PARTY

The 1976 JSC Children's Party will be held Dec. 18, 1-3 p.m., in the Bldg. 2 auditorium. Children aged 2-10 will be entertained for only \$1.50 each. Tickets are on sale at the Bldg. 11 Exchange Store.

The party will offer gifts for the kids, cartoons, and Christmas music. Photos will be available with Santa Claus.

JOGGING CLUB FORMING

An organizational meeting will be held at 5 p.m. Tuesday, Nov. 23, of persons interested in forming a jogging group at JSC. The meeting will be held in Room 206 of the Gilruth Recreation Center.

VOLLEYBALL

The gym will be available 8:30-9:45 p.m. one night per week for mixed volleyball. Tentative schedule is Nov. 23 and 30, Dec. 6, 13 and 20. Keep in practice.

CHRISTMAS DANCES

There is still time to get tickets to either of the JSC Christmas

dances. Cut off date is Nov. 26. Tickets may be purchased from Glenda Lancon, Bldg. 45, Rm. 217, X-2471.

Remember, there are two dances. One is Friday, Dec. 3, and the other is Saturday, Dec. 4. Both will be in the Gilruth Center and the same two bands will play both nights.

Friday night's dinner will be roast beef and you get that and drinks for \$10/person. Saturday night's meal is prime rib and the price goes up to \$15/person.

1977 League Sports Schedule*

SPORT	SEASON DATES	COST/TEAM	EAA SUBSIDY
Men's Basketball	Jan 3-Feb 25	\$80	Yes
Women's Volleyball	Feb 14-Apr 22	\$60	Yes
Men's Basketball	Feb 28-Apr 22	\$80	No
Men's Softball	Apr 18-June 10		Yes
A League		\$72.50	
B League		\$65	
C League		\$62.50	
Women's Softball	Apr 25-June 7	\$65	Yes
Mixed Volleyball	June 6-Aug 12	\$60	Yes
Men's Softball	June 13-Aug 12		Yes
A League		\$72.50	
B League		\$65	
C League		\$62.50	
Women's Softball	June 20-Aug 12	\$65	Yes
Men's Softball	Aug 15-Oct 14		No
A League		\$72.50	
B League		\$65	
C League		\$62.50	
Women's Softball	Aug 15-Oct 7	\$65	No
Women's Volleyball	Aug 15-Oct 28	\$60	Yes
Men's Volleyball	Aug 15-Oct 28	\$60	Yes
Men's Basketball	Oct 31-Dec 16	\$80	Yes

*This is a tentative preview of 1977 league sports. Changes are possible pending budget approval.

Roundup Swap Shop

Swap Shop advertising is open to JSC federal and on-site contractor employees. Goods or services must be offered as advertised, without regard to race, religion, sex or national origin. Non-commercial personal ads should be 20 words or less, and include home telephone number. Typed or scribbled ad copy must be received by AP3/Roundup by Thursday of the week prior to publication.

CARS & TRUCKS

Credit Union Reposs: 75 Ford Elite, 75 Chevy Nova, 74 Chrys New Yorker, 74 Ford LTD. Will show 11/29 - 12/1, 10 am - 2 pm by appt only. Bids opened 12/2. We reserve right to refuse all bids. Call Collection for appt.

72 Chevy Malibu. V8, auto, pwr, air, AM/FM, radials. \$2,100. Wylie, X-4581 or 334-4175 after 5.

73 Toyota Corona wgn. Blue int/ext, 4-spd, air, radials. \$1,950. McCaine, 665-6993.

71 Pont Catalina sta wgn. Pwr, air, see & drive to apprec. Donahoo, X-5276 or 925-2139 evngs.

70 Chevy Kingswood 9-pass sta wgn. Pwr, air, 1 owner, maintained, runs good. \$900. Troeger, 488-0249 after 5.

70 Ford LTD sta wgn. Pwr, air, very good cond. \$950. Redding, X-2478 or 332-1092.

68 Dodge Charger. \$1,000. Costanzo, X-6101 or 629-1478.

73 Toyota Corolla. Air, 4-dr, 1 owner, \$250 below NADA. Wilson, X-3803 or 488-7169 after 5:30.

69 Chevy Chevelle. New eng & front susp, headers, lg tires, xInt for HS or college student. \$850 firm. Paul, 333-3291.

70 Olds Cutlass. 2-dr, 1 owner, 4-spd. \$895. Richeson, 488-8761.

75 Chevy pickup. LWB, 350 eng, auto, pwr, 28K mi, camper cover wired and insul. \$4,195. 943-1752.

71 Ford Galaxie. 2-dr htdop, 351 V8, auto, air, mag whls, pwr, 8trk, vinyl top. \$1,400, will negotiate. 538-1064 after 5.

75 Cutlass Salon. Maroon w/black int, 351 eng, air, AM/FM, 15K mi. Really loaded, immaculate cond. \$4,550 bottom, trade-in offered. 488-7924 after 6:30.

72 Dodge Coronet Custom. 4-dr, air, pwr steer, radio, good mpg, orig owner. 665-2409.

69 Olds Delta Royale. V8, 2-dr htdop. \$550. 331-6967.

76 Dodge Ram Charger. Leaving country, must sell. Z-barted, AM/FM stereo, carpeted. XInt for camping. Asking \$5,000. Mary, 224-6327, X-47, or 644-3912 after 6.

CYCLES

75 Yamaha YZ80B. Laid down boges, 26 Mikuni carb & more, xInt cond. \$350. Talas, X-5823.

71 Honda CL175, low miles, adult driver, good cond, \$275. 71 Honda CB100, good cond, \$175. Smith, 488-3238 after 6.

74 Yamaha 360MX. Mint/showrm cond, never raced, low miles. \$650. 991-4626.

Xmas special: Honda 350SL. Runs good, see to apprec, plenty xtras. \$400. 334-1639 after 5.

Boy's 20-in Schwinn Stingray bike. XInt con. 334-1267.

74 Vespa motorscooter. 200cc rally. \$800 or best offer. Will dicker. Fischer, X-2177 or 472-6910 except Sats.

PROPERTY & RENTALS

3-2-2 contemporary brick in League City. 3 blks to Creek High, pool membshp incl. new paint in and out, by owner. 554-2916.

For lease: CLC-Middlebrook, 3-2-2 plus study, lg mastr bdrm, blt-ins, carpet, drapes, fireplace, fence, pool-tennis membshp incl. 488-4453.

For rent: CLC, lovely 3-2-2 w/fireplace, fence, patio, xtras & landscaped. Allgeier, 474-3961.

74 Winnebago motorhome for rent. \$140/wk, \$22/day, 9 cents/mi. 488-2329.

Lake Rayburn water access lot. Wooded, restricted, utilities, rec facil. Must sell. \$4,695. Colton, 488-2962.

PETS

Free terrier, small female. Ward, 488-5445.

AKC reg Beagles, champ sired. 333-2436.

STEREOS & CAMERAS

Two EPI-50 speakers. \$45 ea. Lake, X-3286 or 523-2137.

Magnavox portable record player stereo. XInt for young child, good cond, great sound. Orig \$129, sell \$20. Labby, 554-6749.

Photo enlarger, print box, frames, timers, trays, easel, neg carriers, condenser lenses, lots of xtras. \$100 takes all. 473-1656.

HOUSEHOLD ARTICLES

Antique English marble-top, marble-back washstand, \$185. Old Hickory table/chair set, bark-on, 36" round table, straight & rocking chairs, \$140. 554-7052.

Two lg black vinyl beanbag chairs. \$15 ea. Edna, X-3984 or 488-2572 after 5.

Mr. Coffee II and Polaroid "Cincher." Both new, would make ideal

gifts. 488-2822.

Solid maple, twin, spindle bed frame. \$35. 488-1366.

Lovely French Louis XV sofa & chair. Perfect cond. \$1,200. 488-5564.

Rug, 12X18, dark brwn tone-on-tone Karastan. Practically new. Pad incl. \$95. 333-4164 after 6.

Bar, \$60. Bar stools, \$25 ea. Corner unit, \$100. Bookshelves, \$25 ea. Dresser, \$120. Queen-size bed, \$110. TV, \$40. Stereo system w/AM-FM radio, \$100, etc. Costanzo, X-6101 or 629-1478.

MISCELLANEOUS

Conn Director Model Trombone, like new, current new price \$230, will take \$110. Olympia portable typewriter, \$35. Rogers, X-4187 or 481-2677.

Delco AM/FM car radio. Fits late model GM trucks and cars, less speaker. \$50. Sanders, X-4418 or 481-6928.

Ideal Xmas gift: Norwegian blue fox shrug. Less than appraised value. 471-4071 after 5.

Santa Claus head set. Real hair. \$60. 946-4013 after 6.

Two 50-yr line tickets for Texas-Texas A&M and Texas-Arkansas games. 488-1256 after 5.

TV antenna and 30' extension pole. \$30. 333-4164 after 6.

Buy a Corsicana fruitcake and help the ABWA Scholarship Fund. Better than homemade. 2-lb, \$6.45; 3-lb, \$9.10; 5-lb, \$14.70. Statz X-4039 or 482-7607.

1972 Cherub 8-ft pickup camper and accessories. Phil, 339-2031.

Antique oak country washstand w/ wishbone towel rack. \$75. 488-4487.

Family membshp in Tennis Club. IBM. Exec typewriter, Model B, xInt, \$145. Royal manual typewriter, portable, xInt, \$35. Yamaha 90cc twin motorcycle, great cond, \$235. Bland, 333-4580.

HO gauge model train. Parts and access, track, switches, transformer & cars. Cliff, 488-1366.

Ray Jefferson SENTRY Oxygen Meter for locating fish. New, in ctn, warranty good. 488-8678.

Membshp in Bal Harbor Racquet Club. Avail Dec 1. Carolyn, X-4551 or 482-6550 after 6.

Handmade Barbie/Ken clothes. Ready for Xmas. Mary Lou, X-4171 or 488-1130 wkends or after 6.

Old collec of children's books. Bobbey twins, Bunny Brown, Honey Bunch. \$1 ea. 488-5564.

Copper tubing. 1-in ID X 1-1/8-in OD X 12-ft long. 334-1267.

WANTED

Chain saw, 10-14" bar. 946-4013 after 6.

Large birdcage. Approx 18-in dia or square by 18-in high. 482-2164.

Used trampoline. 482-1635.

Used desk chair in good cond at reasonable price. Jeff, X-6355 or 482-5393 after 5.

Carpool or riders from NW Mall or vicinity. Kathy, X-2921 or 466-3449.

GM car seat for 1 yr old. 334-4175.

LATE ENTRIES

Tektronix Model 536 Oscilloscope. Like new, w/CA plug-in, probes, etc. \$495 or trade. Lindsey, 488-0517.

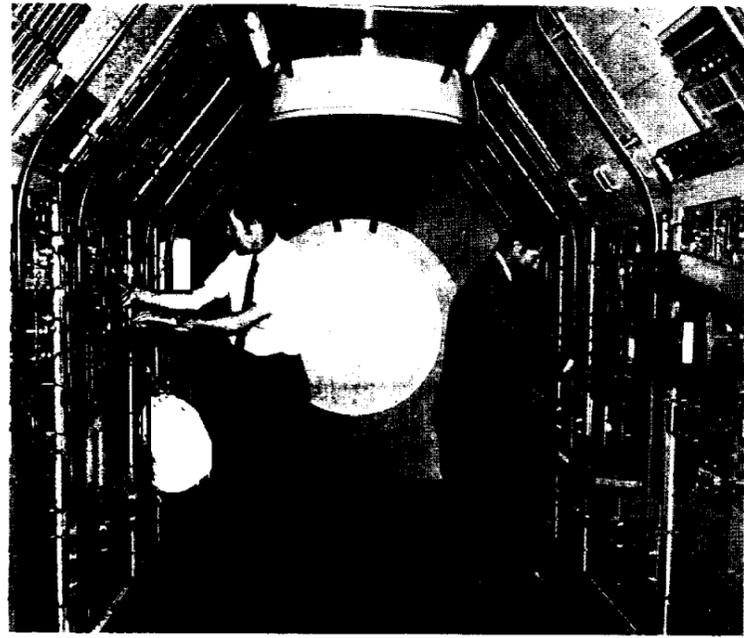
Minibike. Kawasaki 90. XInt cond, have over \$600 invested, make offer, son has outgrown. Joe, X-3163 or 944-6513.

Trail bike: the best. Husqvarna 360 RT, 1974, street legal, licensed, inspected, etc. Joe, X-3163 or 944-6513.

Avocado green shag carpet, 12' X 15' w/padding. \$75. 481-6874 after 5.

71 Mustang. 302 cid, auto, air, AM radio, 59K mi. Has Mach I style grille, hood, bumper and side stripes. Lt blue. 488-2822.

Modern-Mald microwave oven. 30-min timer, cook-defrost switch, roasting rack w/drip pan. XInt cond. 333-4880.



INSIDE SPACELAB — Astronauts Dr. Joseph Kerwin, left, and William Lenoir familiarize themselves with equipment aboard the Spacelab mockup during a recent visit to the Marshall Space Flight Center, Huntsville, Ala. Along with Paul Weitz, Robert Parker and Rusty Schweickart, Kerwin and Lenoir were briefed on Spacelab subsystems and crew activities.

Skylab byproduct monitors bacterial water pollutants

A new technique developed by NASA scientists for rapid detection of fecal coliform bacteria in water systems will be tested in the coastal waters of the New York Bight area of the Atlantic coast.

Under an agreement signed with the Environmental Protection Agency's (EPA) Region II, NASA will supply remote data collecting buoys and provide and operate a laboratory unit specially designed to detect fecal coliforms in saline water.

The Federal Water Pollution Control Act Amendments of 1972 charter the EPA to provide a water quality surveillance system for monitoring the quality of navigable waters, ground waters, the contiguous zone and the ocean.

This act also charges the EPA to

utilize resources of NASA, to the extent practicable, to provide such a system.

The NASA-developed coliform monitor is an electro-chemical method for rapidly detecting coliforms, presently the accepted indicator of bacterial contamination in water. The monitoring device, developed by scientists at NASA's Langley Research Center, Hampton, Va., can detect human and non-human fecal coliform bacteria in a few hours rather than days.

The electronic sensor, developed as a byproduct of early Skylab environmental control systems technology, when operated as part of a computerized monitoring system would permit health authorities to act promptly in the event large

quantities of disease-producing bacteria are discovered.

For several years, EPA has been conducting a monitoring program to define water quality along the beaches of Long Island and New Jersey. EPA is interested in evaluating the NASA-developed coliform sensor to monitor coliform levels along these beaches.

Shellfish beds could become contaminated with pathogenic micro-organisms resulting from ocean dumping of sewage wastes. The coliform sensor has a potential for providing timely information, to aid in determining the degree of contamination of these beds.

The coliform sensor can also be used for monitoring coliform levels in lakes, public water supplies and sewage plant effluents.

A new vehicle mobility concept which holds promise of expanding unmanned explorations on the surface of Mars and other planets has been developed at NASA's Marshall Space Flight Center, Huntsville, Ala.

Known as the Elastic Loop Mobility System (ELMS), the concept is an outgrowth of work done at Marshall and elsewhere on the successful Lunar Roving Vehicle. Carrying astronauts and equipment, the Rover extended exploration of the Moon far from the Lunar Module's landing site.

NASA has landed two Viking spacecraft on Mars. Each has trans-

mitted to Earth large amounts of data about the atmosphere and surface of Mars. But the Viking landers are limited in their exploration, since the spacecraft are immobile on the Martian surface.

They cannot venture into distant valleys or climb hills for a better view of their surroundings.

What Viking needs now, scientists say, is mobility. ELMS or other such systems could provide this roving ability for a Mars landing craft.

The ELMS involves a continuous elastic-loop track device which could be used in place of each of the three landing pads on present landers. It would distribute the vehicle weight uniformly over a relatively large area and combine the suspension and drive systems of the spacecraft into one compact, lightweight package.

Development of ELMS was sponsored by the Advanced Development Office of NASA's Office of Space Science and involved a team effort by the Lockheed Missiles and Space Company's Huntsville Engineering Research Center, the U.S. Army Corps of Engineers Waterways Experiment Station in Vicksburg, Miss., and Marshall's Science and Engineering Directorate.

Technical direction of this research and development effort was the responsibility of Dr. Nicholas C. Costes of the S and E Directorate's Space Sciences Laboratory.

The ELMS main structural component, developed by Lockheed, is a continuous elastic loop with a barrel-like shape. The geometry of the loop and its non-linear spring characteristics enable this system to apply uniform and low contact pressures on the ground and to provide its own suspension system, providing excellent mobility on soft soil surfaces and a smooth ride over hard and rough terrain.

These features, combined with the low internal energy losses in the ELMS traction-drive system, result in high mobility performance, low energy requirements and high power efficiency.

Mobility performance tests on large scale ELMS and ELMS models

have shown that the slope-climbing capability of this system on compact fine-grained granular soils, such as those on the Martian surface, enable it to negotiate slopes of 30 - 40 degrees and, on hard surfaces, as high as 45 degrees.

The same tests have shown that ELMS vehicles can surmount rigid-step obstacles with a height up to 85 percent of the ELMS's length and can cross crevasses with a width up to 90 percent of the ELMS's length.

In addition, ELMS vehicles exhibit high stability when the vehicle is stationary and high maneuverability on both soft soil surfaces and hard, rough terrain.

A recent study conducted by Langley's Viking Project Office and participating experts from Marshall, the Martin-Marietta Corp. and Lockheed concluded that integration of the ELMS with present Viking Lander hardware is technically feasible.

Such a concept would provide a mobile laboratory, capable of conducting unmanned scientific missions on the Martian surface for a period of six months, along traverses ranging up to 150 kilometers (90 miles).

More recent reviews of a potential mobile Viking mission to Mars, using the ELMS concept, are considering missions that can be extended to two years, along traverses ranging up to 500 km (300 miles).

Wanted: Eclipse watchers

Area astronomers are still seeking volunteer observers to help them record a rare series of eclipses to be visible near LaMarque on Thanksgiving night.

A double star system will be eclipsed by the edge of a crescent Moon and should highlight features on the Moon's surface never before charted.

For information, contact Paul Maley, X-6457 or 488-6871, or Dick Rogan, X-5482 or 474-3621.

Balloons fill space age needs

(Continued from page 1)

layer of fluorocarbons (such as Freon) and other gaseous products. The ozone layer is a protective blanket of oxygen which appears to be chemically fragile.

Results of these studies have contributed substantially to the knowledge of the chemical interactions in the upper atmosphere. These results include the first profiles of the concentrations of the gasses chlorine and chlorine oxide and atomic oxygen and hydroxyl radicals at stratospheric altitudes. The National Research Council recently recommended reducing the amount of fluorocarbons released into the air. The Council recommendations were based in part on information gathered on JSC balloon flights.

The cosmic ray experiments are studying fundamental properties of high energy particles by observing the effects of such phenomena as cosmic rays. The JSC Space Physics Branch has developed a cosmic ray laboratory which is providing new information about high energy particles. The cosmic ray lab and earlier, less sophisticated, payloads have been flown many times to ob-

serve particles such as anti-protons and positrons (anti-electrons). These anti-matter particles are thought to exist naturally but their exact quantity is not known. The cosmic ray experiments will help substantiate or alter present theories about cosmic evolution. There are only a handful of laboratories in the world pursuing these studies.

The astronomy observations are part of tests of an ultraviolet telescope being developed by the JSC Space Physics Branch and the Space Sciences Laboratory at Utrecht, the Netherlands. This joint effort has sought to develop a telescope which would look at deep-space objects in the mid-ultraviolet, a range of light which is opaque to ground observation from Earth, but now accessible to observations from extremely high altitudes — preferably space. The UV telescope is considered a good candidate for early use aboard the Space Shuttle and for possible use aboard the Spacelab flights in the mid-1980's.

The UV telescope is being tested aboard a balloon to allow the telescope to float above 95 percent of the Earth's atmosphere thereby

providing astronomers with data almost as high in quality as if it were flown in space.

All of the balloons are launched from Palestine, Texas, by the National Center for Atmospheric Research (NCAR). NCAR (pronounced encar) was established by the National Science Foundation to operate and manage a launch facility for organizations in need of these huge balloons — sometimes as large as hundreds of feet in circumference.

JSC buys the balloon from an independent manufacturer which makes the plastic envelopes according to the altitude and weight capabilities needed. The payload is also prepared by JSC. Other users of the NCAR facility buy their own balloons and prepare their payloads in much the same manner. Once the balloon and payload are ready, personnel from NCAR do the actual helium filling and launching.

The payloads attached to the balloons are connected to a parachute so that when the experiment or test is completed, sometimes days after launch, the payload can be safely returned to the ground. The balloons are not recovered.

AIAA section honors 4 center employees

Four JSC engineers made a clean sweep of the 1976 annual awards presented by the Houston section of the American Institute of Aeronautics and Astronautics.

Dean Grimm received the Professional Service Award. Mark Craig received the Community Service Award. Norman Chaffee received the Section Service Award.

Dr. Winston Goodrich received the new Publication Award for his paper, "Aerodynamic Analyses Requiring Advanced Computers."

Bill Simmons of JSC was recently presented an award as na-

tional AIAA "Membership Chairman of the Year."

The Houston section has also been selected to receive the AIAA Outstanding Section Award for 1975-76.

The award is presented annually based on such criteria as membership activities, organization, community and membership services and educational activities.

Top officers during the year were Loren Wood of TRW, chairman, and Chester Vaughan and Clay Hicks of JSC, vice chairmen.